

DOCUMENT RESUME

ED 288 532

IR 052 189

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TITLE Toward Enhancing the Social Benefits of Electronic Publishing. Report of an Aspen Institute Planning Meeting (Queenstown, Maryland, February 25-26, 1987). Communications and Society Forum Report #1.
INSTITUTION Aspen Inst. for Humanistic Studies, New York, N.Y.
SPONS AGENCY John and Mary R. Markle Foundation, New York, N.Y.
PUB DATE 87
NOTE 22p.
PUB TYPE Collected Works - Conference Proceedings (021) -- Viewpoints (120)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Access to Information; Consumer Economics; *Electronic Publishing; Information Dissemination; Information Storage; Online Vendors; *Optical Data Disks; *Technological Advancement; *User Needs (Information); Users (Information); Videotex
IDENTIFIERS Minitel; *Societal Benefits; Value Added

ABSTRACT

Intended to investigate ways in which electronic publishing might be further developed to serve important consumer needs and social interests that have yet to become a focus for the industry, this two-day planning meeting consisted of roundtable discussions with 16 electronic publishing experts and practitioners. Following a presentation of the items and questions that prompted this investigation, informal discussions aimed at identifying key questions that the project might pursue in its next stages are summarized in sections focused on: (1) the supply and demand sides of electronic publishing as it is today and as it might grow in the years ahead; (2) factors that might spur or obstruct further development; and (3) further topics that should be pursued. It is concluded that the project does not assume that everyone should be a publisher or that electronic publishing deserves promotion for its own sake, but rather that opportunities should be discovered for society to benefit from electronic publishing, not only in the realm of commerce, but also in the other uses and pursuits of knowledge that make for a civilized community. A listing of conference participants is provided. (KM)

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Communications and Society FORUM REPORT

6-16-87
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TOWARD ENHANCING THE SOCIAL BENEFITS OF ELECTRONIC PUBLISHING

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Report of an Aspen Institute Planning Meeting
Wye Woods Conference Center
Queenstown, Maryland
February 25-26, 1987

by
Michael Rice
Moderator

This is FORUM REPORT #1 in a series
intended to invite wider interest
in the concerns and activities of the
Aspen Institute Project on Enhancing the Social Benefits
of New Electronic Technologies,
supported by a grant from the John and Mary R. Markle Foundation.

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TOWARD ENHANCING THE SOCIAL BENEFITS OF ELECTRONIC PUBLISHING

Item: Electronic publishing is already big business in the United States. On-line databases generate some \$3 billion in yearly revenues. ("Databases" are banks of computer-stored information, usually in text or numerical form; the information is available "on-line" when customers at remote locations, using a personal computer or some other terminal device, can gain access to it over phone lines or other telecommunications links.) Overwhelmingly, those revenues stem from business and government users; academic and consumer users account for only one-twentieth of the total.

Question: If this form of electronic publishing is proving so successful with business users, what would it take to make it equally valuable to personal consumers or to users in non-commercial fields?

Item: Besides on-line services, consider the new technologies for the physical delivery of electronically-stored information. The CD ROM (for Compact-Disc Read-Only-Memory) is being designed to hold a vast amount of text or graphics; once a master disc is made, copies can be manufactured at low unit cost, much like LP records--and very much like today's CD music recordings, which are based on a technology similar to the CD ROM's.

Question: Here again, the CD ROM's promoters point to potentially sizable business applications, but might this form of electronic publishing be just as significant to other interests in society? Might it refashion, for example, how we obtain and use standard reference works in education and research?

Item: One form of electronic publishing has already grown into a multi-billion-dollar consumer market: "home video," that is, the sale and rental of pre-recorded videocassettes. Until recently, this business was assumed to be propelled almost totally by the appetite for watching Hollywood-style theatrical feature films in the comfort of one's home. But now some producers and observers argue that the distribution channels for home video (including direct mail) have become so diverse and

highly-developed that the market will support the production of video material responding to highly specialized interests.

Question: If in the past the range of video publishing has seemed no wider than the best-seller list for mass-market novels, can we look forward to a future when its title list might rival that of a whole bookstore? Is this a possible development that, as a matter of social policy, should be specially encouraged?

Such items and questions have prompted the Aspen Institute, supported by a grant from the John and Mary R. Markle Foundation, to launch an inquiry into how electronic publishing might be further developed to serve important consumer needs and social interests that have yet to become a focus for this new industry.

Can electronic publishing deliver gains--in efficiency, effectiveness, or equity--not only to business but to the worlds of politics, human services, research and education, or home life? If so, who is in a position to accelerate progress in these directions? And how?

Our first step was to invite sixteen electronic publishing experts and practitioners to a two-day planning meeting at the Aspen Institute's Wye Woods Conference Center in Maryland, February 25-26, 1987. In an informal roundtable format, we reviewed both the supply and the demand sides of electronic publishing as it is today and as it might grow in the years ahead. We discussed the factors that might spur--or obstruct--further developments. Our immediate aim was to identify key questions that this project might pursue in its next stages, which will include commissioning papers and holding a conference to assess specific proposals for new or expanded services.

This FORUM REPORT is the summary of that meeting. Everyone who receives it is invited to join in the inquiry with your comments, suggestions, or proposals.

There is a special "real world" aspect to this exercise. As a grantmaker, the Markle Foundation hopes to learn from it some of the possibilities for further research or projects that it might support in the work of other organizations. Writing about electronic publishing in Markle's last annual report, Lloyd Morrisett, the president, stated, "Foundations can play an important role in helping to explore new avenues and stimulate changes that will ultimately yield many benefits for the public."

The Supply Side of the Picture

The growth of on-line information services, explained Richard Adler of the Institute for the Future, took off once the technology made it possible for users (a) to achieve close-to-real-time interactivity with computers and (b) to exploit this advantage, thanks to public packet-switched telecommunications networks, at any distance from the computer in which a database is stored.

Three-quarters of today's on-line databases offer essentially numerical information: credit records, stock quotes, demographic data, etc. The rest offer text. "These services may be reaching saturation," Adler said. "They're now used by just about everyone who has to have them, while anyone else who might be interested is put off because they're not particularly user-friendly and they're expensive."

Just where to draw the bounds of electronic publishing is questionable. On-line services should not be confused with using computer networks for other purposes--for communications (or "chat") among members of affinity groups, professional, political, or hobbyist; for playing games; or for making transactions. Even computer "bulletin boards," which Adler called "an underground phenomenon," may be only borderline.

In trying to define "genuine" electronic publishing, Anne Branscomb, a communications lawyer, pointed to a key criterion when she asked, "Doesn't 'publish' mean 'to make public'?" Access to a given network must be open to anyone on equal terms, she implied, before the information offered on line can truly be said to be "published."

Ted Nelson, director of a software development enterprise called Project Xanadu, argued that electronic publishing in the future should take shape from his concept of "hypertext." In a hypertext system, users--or "seekers"--would not be imprisoned by the sequential patterns of conventional writing, storage, and retrieval methods. Instead, they could choose among a wide variety of "interconnections with, or pathways to and through, their subject." Not only that: they could add their own content, and others could find it, using a kind of electronic footnoting by which "everything new is linked to everything already there." At the same time, anyone who added material--who thus "published" something--could be rewarded every time anyone else retrieved it: the act of retrieval would automatically trigger a royalty payment.

The essential challenge for on-line publishers, said Steven

Sieck of LINK Resources, is to add value to basic information--to make it more conveniently accessible, to organize it to be more useful. Most databanks contain "raw, commodity stuff," which is sold to information specialists who add value by putting it to work for their own purposes--stockbrokers, librarians, legal researchers, etc. "But the industry is running out of such people," he added. "Does that invite next the entry of editors and producers who can package information for broader use by people who are not specialists themselves?"

"Yes," replied Robert Lippincott of WGBH Boston. "It's a problem of design. Packaging information for actual use has to allow for human factors; it has to match up to our information digestive behavior. The real act of electronic publishing occurs when something appears on the screen; anything in the database is just raw material."

"We need to define and concentrate on those design issues," urged Mary Milton, formerly of Markle. "Electronic publishing doesn't require behavior modification. It's just the opposite: the technology must be made to fit human nature."

Does this suggest, the group was asked, that something inherent in the technology makes it very well suited to publishing certain kinds of information--and very badly suited to other kinds?

"It's suited to numbers especially," said Lippincott.

"More than that," added Gary Arlen of Arlen Communications, "on-line media are best for numbers that change all the time." The enormous advantage over printing figures on paper comes from the ease of updating an electronic database in an instant.

"Number crunching is cheapest," Ted Nelson granted, "but text comes next, then graphics, then images like the Landsat pictures of the earth seen from space, then audio-and-video. What the technology can do is just a matter of band-width. The band-width necessary to accommodate all these elements seems costly now, but new microchips, optic fiber, and other developments are pushing us toward expanded transmission and retrieval capabilities where that cost will not have to be a problem."

The failures to-date in the United States of videotext services aimed at consumer uses in the home were very much in mind, though it took a while before someone dared mention, as he put it, "the 'V' word." Did those failures stem from inadequate demand--or from design flaws in the forms of videotext that were offered?

Richard Adler remarked that some videotext systems required

from 30 to 70 seconds to "paint" a single-screen image--much longer than anyone would want to wait. Ted Nelson said that the technical potential of videotext was frozen at very low levels in its early trials; he implied that a fair test still awaits "tomorrow's technology." John Carey of Greystone Communications noted that both teletext and videotext, while originally conceived as consumer services, have developed thus far only in the market for business information, but he too wondered whether the growth of a consumer market for electronic text might be just a matter of time--and a different approach.

Jerome Aumente of Rutgers asked, "What can we learn from the experiences with videotext? There must be research results from the trials conducted by companies like Knight-Ridder and Times-Mirror. Shouldn't we ask to see and examine those results?"

Seconding this proposal, David Miller of DCM Associates said, "We should look at what didn't work--and why."

To appraise any form of electronic publishing, observed Greg Harper of ComTech, one has to look at four different dimensions: (1) the content it can handle, (2) the speed and ease of delivery, whether electronic or physical, (3) the means of storage, whether remote or local, and (4) the structures for gaining access.

The participants showed an eagerness to make comparisons along those dimensions between on-line services and physical-delivery forms of electronic publishing--like the new CD ROM or the more familiar videocassette. The latter encourage "browsing," some argued, because in searching at leisure through material stored on a disc or cassette, the user does not incur the time-based costs of telecommunications--the costs of "connect time" between one's own terminal and a remote database. On the other hand, it was pointed out, only networked information banks can offer constant updating and expansion.

"It's not a choice of always using just the one or just the other," Gary Arlen commented. "It's a problem of appropriate technology--what's appropriate for the particular purpose?"

The "optical media" technologies (including the CD ROM) cover a "whole spectrum of stuff," explained David Miller, noting their distinctive features: "They let the user possess the information, not just dial it up; they're interactive in real time; they provide hard copy on demand; they can handle images much better than existing on-line services; they're capable of dense, compact storage; they're durable and permanent; and they offer great economies of scale in mass replication."

Jonathan Pollard, head of Newsreel Access Systems, described getting started with his own, highly specialized CD ROM "publication." As a producer at the ABC television network, he saw how difficult it was to assemble historical film footage for news and documentary programs. There are many film libraries around the world, and the task of searching through all their index cards was laborious, haphazard, and expensive. He conceived of gathering all the index material from all the libraries on a single CD ROM, then leasing copies of the CD ROM to major production organizations which could then conduct their own searches at a fraction of the time and effort they used to spend.

There were gasps all around when Pollard revealed he charges \$60,000 for a one-year lease of a copy of his disc. "That's value-based pricing," Adler commented. Miller compared it to selling a whole database at a one-time charge upfront (though, strictly speaking, the \$60,000 lease price is a one-time charge each year).

Defending the price, Pollard pointed to the savings the users of his disc realize as opposed to having to search through every film library themselves. Moreover, he said, "the subscription market underwrites the spot market." Because certain users are willing to pay the \$60,000 a year for enjoying first-hand access to all the information all the time, Newsreel Access can also afford to respond to individual requests on a per-inquiry rate, or to permit browsing through the disc on an hourly charge.

His next step, Pollard added, will be an on-line system cataloging current film output to supplement the CD ROM file of past output. In addition, at a lesser (but unspecified) price, a modified version of the CD ROM will be offered to the educational market--"one that can be used for research but not for obtaining footage."

This example of alternative ways to package and price an electronic-publishing product stirred a small commotion of interest in the group. Paul Kaufman of Video-Tel, a new database publisher that will produce a guide to available videocassette program titles, argued that matters of price structure will be crucial to delivering--or withholding--many of the social benefits electronic publishing might bestow. Pricing policies, he said, should be a focus of the Aspen Institute's inquiry. "What's the meaning of pro bono here?" he asked, "--to give to consumers what they can't afford to buy themselves?"

Jerome Aumente wondered what we might expect next from CD ROM and other new forms of electronic publishing. He suggested tracking particular initiatives as they develop, then succeed or fail, with an eye toward extracting lessons of general importance.

Anne Branscomb cautioned against considering every technical system as a separate prospect. "Isn't the whole push of technology," she asked, "advancing toward the integration of all possible outputs--text, graphics, sound, still images, moving images?" Anticipating our discussion of the demand side of the picture, she went on to argue: "The masses don't read and write: they listen and hear. So we have to make a system you can talk to!"

"There is a fusion of storage media underway," Pollard agreed, citing a demonstration where the Groliers Encyclopedia CD ROM disc, a videodisc, and a music disc were used all at once.

Robert Lippincott cited another example of disc publishing: the BBC's Domesday Project. Whereas the original Domesday Book appeared on parchment 900 years ago, this new reference work on the culture, economy, society, and environment of the United Kingdom uses LV-ROM technology (incorporating digital data on a LaserVision disc). One disc holds 9,000 sets of data, 50,000 pictures, and some video sequences. The other contains 24,000 Ordnance Survey maps, 900 aerial photographs, 500 satellite pictures, and more. The necessary hardware includes the BBC microcomputer already installed in most U.K. classrooms. For promotion, there is even a broadcast television series called "Domesday Detective." According to CD-I News (January 1987), the project cost \$5 million and over 22,000 man years of effort.

With the Domesday discs, "people start free-associating," Lippincott was told by a BBC representative. "Users really do become seekers."

Can we look forward, the group was asked, to a single standard storage medium able to hold information in every form?

"No, not in a physically deliverable medium," replied Ted Nelson, "but yes, in an on-line system--if the rates for connecting with it are set reasonably: then we can search boundlessly."

"But who's going to want this--to 'search boundlessly'?" asked Paul Kaufman. "The reality is: we do work within bounds--most of us, anyway."

"As all these technologies are advancing so rapidly, no one can recognize the extraordinary power they'll give us," Nelson stated. "We should build for an elite--for those for whom Scientific American isn't enough. In the process we'll spawn all sorts of useful innovations that will benefit everyone." His own system (Xanadu), he added, "is an empty vessel into which all on-line literature can migrate."

The Demand Side of the Picture

After years of trying to introduce new information technologies to consumer markets--from Warner's 2-way cable television system (QUBE) to early experiments with teletext--Greg Harper confessed to having changed his mind: "We should look for applications first. Then go to the engineers. They should work for us. We shouldn't expect them to take the lead."

To illustrate what he meant, Harper cited the need for a national organ-sharing network and how it can be met by teletext technology. Hospitals with teletext decoders will tune to a local television signal that is carrying (in a form that is invisible on ordinary receivers) a nationally-distributed, continually-updated list of (a) all the patients across the country in need of organ transplants, (b) all the organs that are--or are about to become--available, and (c) the schedules of corporate aircraft that are regularly called on to transport organs as a public service. Given this information, a medical practitioner will be able, all at once, to make a three-way match: recipient, donor, and airplane.

"But that's not teletext publishing--in the sense of 'making information public,'" objected Gary Arlen. "That's a case of closed-circuit data transmission. On the other hand, it is a good example of matching a particular need or application to the right technology."

John Carey of Greystone Communications identified three dimensions for differentiating the potential demand for electronic publishing methods and output: age, sex, and useability.

"Older people show little interest, and younger people can get very excited," Carey said, "but the middle group, while they can be stirred to take an interest, are very tough customers. It's a generational issue. Habits are hard to change. So, there's going to be a long-term wait before these technologies come into widespread use."

"Women are more likely than men to use terminals in the workplace," Carey continued, "but, overwhelmingly, it's men who use computers at home or computer networks like The Source. Here, it's a functionality issue. Computers simply haven't proved to be of much help to women in the home."

"Finally," he said, "the mass public lacks the basic skills, such as operating a keyboard, needed to use these technologies. There can't be much demand for something that, for most people, isn't useable."

Jerome Aumente, who directs the Journalism Resources Institute at Rutgers, felt that electronic publishing's most notable attempts to cultivate consumer demand in the home setting, namely, the videotext trials involving selected households, all suffered from being short-lived and unreal. It takes time for people to devise uses for a new information resource. He cited the experience of students at his own university who, given access to a Dow-Jones electronic news service, have started to use it not just for their journalism assignments, but for a wide variety of other courses.

Demand reflects both the consumer's purpose and the competing alternatives. "When you already have the convenience of the printed newspaper," said Richard Adler, "no one goes on line to read today's Times--but you do go on line if you need to delve into the archives."

"A unique benefit of on-line services," he continued, "is their communications capability--you can chat." A computer network called "Bits," for example, serves as the electronic adjunct of the print magazine, Byte, providing "a rich dialogue among editors, readers, and writers."

But is that what we mean by "publishing"? Is it not just another form of conversation among people with mutual interests?

Greg Harper suggested that the person who sets up an electronic bulletin board on a computer network and creates the software that permits others not only to retrieve information but to add their own, is acting as a publisher.

The French Minitel system (based on small terminals installed by the phone company in homes to serve as electronic directories) has spawned, Harper said, thousands of amateur publishers, offering poetry, games, essays, ideas: "They're the electronic form of the intellectuals' cafe." What began as a telephone-number directory has grown into a data communications network in which anyone sets up a database service and the phone company will do the billing and split the revenues. "Daily operations of Minitel are showing great profits," he added, "though the capital cost that is being incurred to rebuild the French telephone system is another matter."

The Minitel experience, Aumente commented, illustrates both the advantages and disadvantages of government's involvement in the development and promotion of new information technologies.

What can we learn from Minitel that might be applied in the United States?

"Minitel has shown," said Branscomb, "how important it is to

standardize the protocol by which we can use computers to communicate with each other. It's essential to adoption and compatibility on a nationwide scale. The French are also demonstrating what can be accomplished when a national government is willing to risk a huge, long-term investment in a new technology. They've created both the infrastructure and the possibility of a national market. Are we going to see comparable results in the United States when we have to rely on the diverse initiatives of different phone companies that are all preoccupied with short-term competitive challenges?"

"The French solved the chicken-and-egg problem," Adler said, referring to the decision to equip phone customers with Minitel terminals for free: "They gave you the omelette pan. And if you put terminals in people's hands, they start using them--now in France, to the extent of some 83 minutes per month per household. You must also create a critical mass of information sources on the network--you have to give people someone to talk to--before it takes off."

Aumente approved of Minitel's pricing structure for database publishers and users: "You can get started at one price tier, say, a pay-as-you-go option; then, with greater volume and sophistication of use, move up to another tier, say, a subscription. It's like having bicycle training wheels to learn how to ride. In general, Minitel is a case of government's legitimizing a new technology for the general public--to use a keyboard to work with text on a screen."

"In the United States," Lippincott added, "only 'computer people' use networks, but in France ordinary people use Minitel."

"The key lesson," Harper said, "is the simplicity of the terminal, the use, the billing. Minitel works for the general population because it's a 'lowest common denominator' service. It's something everyone can have and everyone can use. It shows the virtues of standardization--in high contrast to experience in the U.S., where both government and industry typically frustrate the efforts of standards-setting bodies."

Arlen cautioned, "Minitel is not for everyone. It's in only one-third of the households; in order to keep it for free, they have to maintain or exceed a certain minimal level of use. Minitel has not, in fact, replaced the printed directory. Instead, it co-exists with the printed directory and is even fostering new print magazines."

"Everything we are hearing about Minitel," said Steven Sieck, "is focused on 'kiosk' services, that is, real-time transcripts of just talk--what you might call crazy conversations. It shows that the kind of computer chat we find here on CompuServe bulletin boards will

be taken up on a broader scale if it's made available. But Minitel offers no evidence of providing high-value information of the sort that, say, Mead Data Central offers in the U.S. The question is: Can the 'kiosk' concept lead the way to wider use of electronic databases without threatening the revenue base of the high-value information providers?"

"Maybe," Carey ventured, "Minitel has no lessons for us. All the data on its purported success come from the French telecommunications establishment. I'm suspicious." Another member of the group compared the current rage for Minitel to the reputation accorded QUBE in its heyday--a reputation for consumer impact and acceptance that proved to be illusory.

Henry Tom of Johns Hopkins University Press asked, "What is the social benefit of such a service? Does anyone get anything out of it besides the middle class who are already rich with information sources?"

"Why indeed," asked Paul Kaufman, "are we having this discussion?"

Minitel may be important to this inquiry, it was suggested, precisely because of its publishing function. Minitel seems to make it possible for anyone, with next to no capital, not only to publish--in the sense of "making public"--but also to capture revenues, all in a single, integrated system. Does the Minitel model presage a new age when the barriers to entry for would-be publishers virtually vanish? If so, would this not contribute new vitality and diversity to the democratic marketplace of ideas?

"Electronic publishing does not mark a discontinuity with publishing media of the past," Nelson said. "You could always type up and duplicate your ideas. There's always been vanity publishing."

"No," Carey objected, "potentially, electronic publishing can make a great difference: it can expand into a far more significant phenomenon what has been just a tiny part of publishing before."

What are the human needs that electronic publishing can meet more effectively than other publishing media?

"The need for more time," Sieck said, "or, rather, the need to make better use of one's time. On-line information can serve as a kind of electronic clipping service, making available just what we need to know--and only as much."

"Electronic publishing," Pollard stated, "comes closest to

the workings of the human mind. If, by broadening access to computers, you create the power to make all sorts of connections, people will better satisfy their knowledge needs--they'll be searching a larger universe."

David Miller cited the enthusiastic reception that library patrons have given to a new disc-reference system: "It's easy and quick to find book titles, and you can get a printout of the items you want to pursue. But librarians aren't so happy: it eliminates their role as editor/gatekeeper. The disc appears to be meeting a need that was not so well served before."

Are there inherent barriers to doing broadly imaginative information searches, as opposed to simply getting the answers to a limited set of formal questions?

"With optical media," said Sieck, "you can do full-text searches based on chosen words or phrases--without paying the \$100 an hour it might cost you with an on-line system, and without having to work laboriously through hierarchical menus."

"What we need," Lippincott said, "is custom access, serving the user as editor, capable of browsing, of going 'fast forward,' of getting up to our speed."

Adler observed, "We're at a transition point with interactivity. Now we can begin to 'enter into conversation' with published material."

"Electronic publishing responds well to the needs for time-sensitive information and for access to great volumes of information," said Mary Milton, "but there is also the sort of information we need to manipulate, images as well as text, and here, once you get away from tree-and-branch structures, it's very hard to design in all the desirable access paths and options."

"I'm not interested in crap," Carey stated, "I'm not interested in a system where everyone can input. I want closed systems where the pertinence and authority of the information is what I value."

Seeming to agree, Mark Nadel of the Office of Technology Assessment said, "We need help in dealing with information overload, and electronic publishing permits the involvement of more editors who are not themselves publishers, pointing users with a sort of Good Housekeeping Seal of Approval to the information they will find most useful."

"Some message channels," Branscomb added, "get burdened with more stuff than anyone can wade through. Certain closed-user groups have their own editors--or 'moderators'--to control the problem."

"We have to distinguish between need and demand," Kaufman said. "There exist some 60,000 non-theatrical videocassette titles, indicating a need for a reliable way for people to choose among them. But our research found that people didn't even know all these other cassettes existed--only Rambo. They didn't know what was good or bad; they didn't know how to buy. Demand will grow only with knowledge of what's available. So, we're setting up a database containing evaluations of all the titles, producing a printed guide, and promoting an 800-number for ordering by telephone. Our revenues will come from what the consumer pays for the printed guide and from a margin on the orders placed through the 800-number."

Electronic publishing has to offer "what's useful--'the news you can use,'" said Arlen. "'Telegambling' would have made videotext a success! What kinds of spurs would get a broad business going--or is this destined always to be an all-niche industry?"

In that vein, Carey speculated that permitting a widely popular function like gambling might help to spread and bring down the operating costs of an extensive electronic-text network, thus making other services affordable that on their own would cost too much to provide. He likened the pattern to the growth of home video, which in its first years thrived on distributing feature films but may now be able to support educational and special-interest programs.

Similarly, said Miller, referring to the success of the compact disc in the consumer market for recorded music, "The CD ROM is the entertainment industry's gift to the information industry."

If the concern is for social benefits, Henry Tom stated, "we should look at the information needs of non-profit organizations or at ways of using this technology to encourage positive social change. Take the problem of adult illiteracy: commercial publishers won't touch it."

Miller, too, stressed information of importance to the political and governance needs of society. "Transactional information is well taken care of, but databases like the League of Women Voters' guide to water resource issues need special promotion."

Arlen advocated concentrating on uses in schools and educational institutions--"so the next generation will carry the habits of using these systems into their private lives."

Spurs and Obstacles to Further Development

What could give new impetus to the growth of electronic publishing, especially for reasons of social benefit? And what stands in the way?

"CD-I [for Compact Disc-Interactive] deserves special attention," said Steven Sieck of LINK Resources, "because this 'appliance,' building on the success of music CDs, can deliver 'edu-tainment.' It may be possible to enhance some existing CD-Audio players for CD-I, but mostly the advantage is that the industry's buildup to produce CD-Audio will have the effect of bringing down the initial cost of CD-I players."

Just how CD-I would improve on CD ROM seemed mysterious--perhaps a fair impression, given Rob Lippincott's complaint, "CD-I is only 'paperware' at present. Moreover, the incremental cost of a new CD-I player will fall first on the same people who have already bought the CD-Audio player. It's my fear they won't have clear reasons to go out and buy a second, next-generation CD player."

Taking the opposite view, Ted Nelson predicted: "CD-I will sweep the world like VHS." ("VHS" appears to have overwhelmed competing technical standards for the videocassette recordings used in home video.)

"But there was a huge pre-existing body of program material to put on VHS cassettes," Paul Kaufman protested, "while nothing exists for CD-I!"

"Are we approaching this issue from the wrong angle?" asked Jonathan Pollard. Instead of looking to the next technology, should we try to strip away the obstacles that are discouraging potential users of existing technologies? The greatest social benefits will accrue when you lower the obstacles to use. Take CD ROM, for example. Today you generally have to go to specialized service bureaus to program your CD ROM application for you. If instead more people are brought into the knowledge of how to do it themselves, we would see a much faster, wider realization of the possibilities."

"Foundations should invite proposals for new projects using CD ROM technology," Pollard urged. Asked to estimate what this would cost, he said, "It takes only \$5,000 to make the master disc once you have the material to put on it, but the editorial costs of assembling the material will vary tremendously according to the nature of the project."

Mary Milton argued for a much more systematic sharing of

lessons learned by all the various entities now at work on interactive hardware and software. Ted Nelson indicated that the Smithsonian's new National Demonstration Laboratory for Interactive Educational Technologies could serve this purpose.

Should new R&D efforts be oriented to the format (how to build a better player, etc.) or to the task (for example, how to teach literacy)?

"The task shapes the tool," argued Lippincott. "I call this 'the flying dog problem.' When we start to talk about these technologies with television producers or authors, they give you this strange look--as if you're talking about something like a flying dog. All you can say is: It's sort of like a dog, and sort of like a bird, but it's a dog that flies. Then they ask, 'Well, how long does it cost you to keep one for a month?' or 'How much does it weigh?' So what we really need are flying dogs: We need to have them and watch them and measure them...."

Should every proposal for new developmental work be subjected to a test of social importance? For example, should we ask whether flying dogs will do for blind pilots what seeing-eye dogs do for blind pedestrians?

"Take the tools out of the hands of engineers," Kaufman asserted, "and put them into the hands of real-world people with problems to solve or goals to serve."

Others argued against assuming that the choice or knowledge of the most valuable applications comes first. "Take PacMan," said Ted Nelson, "it's the best example of how hidden options are revealed in the playing. The PacMan game is the precursor of the office systems of tomorrow: It gives instant rewards--and keeps offering more."

Greg Harper cited the electronic information terminals at Epcot. To do their informing jobs, they combine a host of media--recorded sound, a live operator, electronic text, full-motion video, etc. Presumably, the technologies were chosen to suit the message needs, not the other way around.

At this point, it was confirmed that the CD ROM cannot play full-motion images; it is not a videodisc; its images are either still or very limited in motion. With this revelation more than one crest fell. "Let's not blow our fuses here!" interjected Richard Adler. "We should commission someone to lay out all these technological alternatives in linear fashion--their distinctions, timelines for

further development, production costs, etc. And we shouldn't forget the alternatives that offer 'just text'--they're still in their infancy."

Pollard proposed a two-step process: "First, commission someone to figure out the laboratory possibilities; then, send out cadres of technically-conscious information providers to different professional or social-interest groups--and make sure they listen!"

Topics to Pursue

As the discussants headed into their final session, it was clear that their interests in further inquiry tended to diverge according to the features of electronic information systems that excited them most.

Some wished to concentrate on approaches to electronic publishing based on the conventional print publishing model, that is, the model of creating or organizing information in a product or service (the book, the disc, the database, the cassette) and offering it to buyers or users for a price. Others were far more intrigued by the electronic networking model, in which users can add as well as retrieve stored information; in that case, a user might face a price of admission to the network, but not a price for the information as such. Computer networking is obviously a communications vehicle of distinctive importance, but the question of just when it also constitutes "publishing"--and when it doesn't--was not resolved.

Similarly, there was a split between (a) those whose first interest was information retrieval--in the straightforward sense of getting out of electronic storage the particular fact or text or reference one needs--and (b) those whose keenest concern was for interactivity. The latter were looking for more than a simple, "Ask and you shall receive." They were calling for systems in which the user interacts with the programmed software in such a way as to create content or experience that can reasonably be regarded as new--as going beyond what the software designers created in the first place. Here again, there is a problem of defining where "publishing" stops and some other activity (writing? playing? performing? pseudo-conversing?) begins.

In all cases, however, the spurs and obstacles to further development seemed much the same.

The obvious spurs were (a) the existing examples of success in using electronic means to meet information needs faster, less

expensively, or more conveniently than would be possible by other media, all suggesting the prospect of still other applications just waiting to be devised; (b) the growing familiarity with the personal computer (and, for that matter, push-button controls in general) throughout the society, thus expanding the number of people who have the skill and readiness to tap electronic systems; and (c) the momentum that success in the consumer electronics business (music CDs, for example) can lend to new products in the information business.

The widely apparent obstacles, on the other hand, were (a) the costs of entry, still steep for most forms of electronic publishing; (b) the costs of access, particularly discouraging for consumer uses; (c) ignorance of the service possibilities; (d) ignorance of the tools and how to use them; (e) disparate technical standards; (f) the challenges to designing hardware and software that closely match up with human perceptions and thought processes; (g) insufficient market reach to support services dependent on widespread participation; and (h) legal problems of copyright protection and information-provider liability.

That last obstacle prompted further comment. "How can electronic publishers protect their investment and derive value from it?" asked Anne Branscomb. "Most of the lawyers involved are preoccupied with copyright, but the real issue for systems where various information providers or even ordinary users can add material is, 'Who's responsible?'"

Electronic bulletin boards, said Aumente and Arlen, have already produced conflicts between the system operators and users who enter items. The rights of censorship--or of protection from it--have not been settled. There are two issues, Miller explained--"how to project the identity of the data originator, and how to preserve the integrity of the data."

This Aspen Institute project, Paul Kaufman recommended, should tackle broader issues:

- How to gauge standards of social benefit in the electronic publishing arena as compared with other fields (print publishing, television, etc.);
- How to identify human needs that electronic publishing could serve but is not likely to if dependent on market forces alone;
- How non-market interventions could influence the price points at which electronic publishing products or services are offered; and
- How to find or devise models for introducing these technologies to a broader public.

More basically, Branscomb said, "We need to specify which types of information are best delivered by which medium."

Aumente argued for "hooking into a real project--in criminal justice or health care--and assessing what works, what doesn't, and why in its use of electronic publishing resources. Make that a case study for others to build on."

Nadel wondered whether "the government should put up the money to send you in electronic media the information they would otherwise send you in print"--a vision, perhaps, of an electronic W-4 Form.

Miller advised trying to find out how much interaction people really want. "What are the regularities, if not the rules, for the most useful--and used--systems?"

Said Carey, "Maybe there are no apparent social benefits. Maybe it'll take a long time for any to appear. Perhaps this development will be more like that of the telephone than of television. If so, then a laboratory approach would be a good idea. Human-factors people tend to be psychologists; marketing people are a separate crowd; educators come from still another perspective. These different camps don't talk much with each other--get them together."

"Identify promising niches," Arlen suggested, "and goose 'em along a little."

Kaufman volunteered to start identifying the goals that a purely market-driven electronic publishing industry is not likely to serve: "(a) avoiding war, (b) creating jobs, (c) improving education, (d) improving the environment, and (e) overcoming racial bias."

Tom urged paying attention to adult education apart from institutional settings, and involving citizen and non-profit groups (to develop leadership skills, literacy, and civic participation). "Can the Children's Defense Fund afford LEXIS, for example? If not, should a foundation or someone else give them a complimentary subscription?"

This notion led to the suggestion: What if the Markle Foundation were to offer to ten or fifteen non-profits subsidized access to their choice of commercially available databases? Would this show what they could gain from taking advantage of electronic publishing resources? What if, even with the cost barrier removed, there was little significant use? Would that indicate the existence of still other barriers, such as difficulties with the tools or

software? Or would it suggest that some organizations will find nothing on the market of real value to them?

Pollard replied, "I'd rather see ways of allowing potential users to dabble with different possibilities, some of which they might create."

Kaufman, again trying to get the group to recognize that programmed videocassettes are a kind of electronic publishing, too, said that hundreds of cassettes now exist to meet the needs of the business community, but important other segments--citizen groups, social services, the arts--are not similarly served by this medium. Funds should go into production and distribution to show how cassette programs can meet their needs as well.

"This is all reminiscent," Eileen Connell remarked, "of cable access conferences where everyone assumed--quite falsely, as it turned out--that access to a medium constituted access to an audience."

The more apt comparison, the moderator suggested, might be to conferences like one the Aspen Institute sponsored some years ago that first introduced small non-profit groups to what they might accomplish with the desktop computers then becoming available: Their principal activities may have stayed the same afterward, but their effectiveness at recruiting members was exponentially enhanced.

The assumption of this project is not that everyone should be a publisher (though some participants entertained that vision) and not that electronic publishing deserves promotion for its own sake (though some confessed to a faith in the possibilities that would justify exactly that--"I can't accept," said one of the true believers, "that we're all demented").

More modestly, our guiding interest is to discover opportunities for society to benefit from electronic publishing not only in the realm of commerce, but also in the other uses and pursuits of knowledge that make for a civilized community.

The next conference (in Fall 1987) will focus on just two or three aspects of this interest, as framed by papers to be commissioned expressly for the purpose. It too will be the subject of a FORUM REPORT, and copies of the final complete texts of the commissioned papers will be available on request.

Aspen Institute Project
for
Enhancing the Social Benefits of New Electronic Technologies

ELECTRONIC PUBLISHING
Planning Meeting
February 25-26, 1987
Wye Woods Conference Center
Queenstown, Maryland

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